

REMARKS

Review and reconsideration on the merits are requested.

Applicants first address the art rejections in the order posed.

Rejection of claims 1-8, 13-15, 17 and 58-60 under 35 U.S.C. § 102 (b) based on Tavss et al, (US 5,407,742)

Distinguishing features of the claimed invention are that the shape-memory polybutylene terephthalate laminate film comprises:

(1)(a) a polybutylene terephthalate film, (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil;

(2) the shape-memory polybutylene terephthalate laminate film is subjected to a shaping treatment to the first shape at a temperature T_1 equal to or lower than the glass transition temperature of the polybutylene terephthalate, deformed to a second shape at a temperature T_2 higher than the glass transition temperature; and then

cooled to a temperature T_3 equal to or lower than the glass transition temperature so that the laminate film is fixed to the second shape; thereby

(3) making it possible to allow the polybutylene terephthalate laminate film substantially to recover the first shape from the second shape when exposed to the temperature T_1 or higher; where

(4) the first shape is a curled shape, and the second shape is substantially a flat shape or an oppositely curled shape.

In contrast, Tavss discloses a structure which is useful for making containers for dentifrices, such as tubes, which is comprised of a structure where the layer which contacts the dentifrice consists of a **blend** of polybutylene terephthalate and polyethylene, and other layers can consist of adhesives, paper, foils, other polymers and the like depending on the properties desired (Abstract of Tavss).

Specifically, Tavss calls for “A paste dispensing container comprising an enclosed space, wherein the innermost surface of said container contacting said paste being of a **polymer blend** of polybutylene terephthalate and polyethylene wherein said polybutylene terephthalate comprises about 80 to 99 percent by weight of said polymer blend and said polyethylene about 1 to 20 percent by weight of said polymer blend whereby said container has an absorbtivity for organic components of a paste less than that of either polybutylene terephthalate or polyethylene alone (see claim 1 of Tavss).”

Thus, Tavss does not teach a shape-memory polybutylene telephthalate laminate film but a polymer blend of polybutylene terephthalate and polyethylene such that the polybutylene terephthalate comprises bout 80 to 99 percent by weight of the polymer blend and the polyethylene about 1 to 20 percent of weight of the polymer blend as one layer of a tubular container having a plurality of layers in the body portion (see column 2, lines 55-62 of Tavss).

Specifically, Tavss teaches at column 1, lines 29-34 and Figs. 1 and 2, #10 that

“A substrate 10 is shown in cross-section to reveal possible components that can be used to form a multi-layer tube construction configuration. The innermost layer 11 is a layer of the blend of polybutylene terephthalate and polyethylene. This layer will contact the contained liquid or paste. In most instances, it will be a paste such as toothpaste. The next layer 12 is usually an adhesive layer. This

adhesive layer bonds the polybutylene terephthalate and polyethylene blend layer with another layer such as an optional metal foil later 13, such as aluminum foil.”

In Tavss, the innermost layer 11 of a layer of the blend of polybutylene terephthalate and polyethylene is combined with an optional metal foil layer 13 via and adhesive layer 12 (see Fig. 1 and 2, #11 to #13). Tavss teaches at column 3, lines 39-44:

“A metal foil layer will be used in laminate construction where the tube is to remain collapsed after being deformed. The metal foil counteracts the memory property of the plastic layers.

However, this memory property derives from polyethylene and not from polybutylene terephthalate, because Tavss describes at column 2, lines 29-37 thereof that:

“In addition, **polyethylene** has a memory property, that is, it does not remain compressed when squeezed. This is a disadvantage for some dentifrice tubes. To counter such a lack of deformability the metal layer must be relatively thick so that deformability is imposed on the plastic so as to overcome its memory.”

Accordingly, these features of Tavss are different from the claimed invention at least in distinguishing feature (1) such that the shape-memory polybutylene terephthalate laminate film comprises (a) a polybutylene terephthalate film (not a blend with polyethylene), and (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil.

In this regard, it must be noted that in the present invention, as described in the specification, page 5, a PBT laminate film having excellent shape memory and high-temperature dimensional stability has been obtained by (i) subjecting a laminate film of the above PBT film and another film or film laminate to (2) a shaping treatment to a first shape at a temperature T_1 equal to or lower than the glass transition temperature T_g of the PBT film, while maintaining the

first shape (ii) deforming the resultant shaped laminate to a second shape at a temperature T_2 higher than the T_g ; and (iii) cooling it to a temperature T_3 equal to or lower than the T_g (see page 5, lines 15-22 of the specification), thereby (3) making it possible to allow the polybutylene terephthalate laminate film substantially to recover the first shape from the second shape, and the second shape is substantially a flat shape or an oppositely curled shape, about what T_{AVSS} is silent.

Applicants respectfully submit that the T_{AVSS} does not anticipate or render obvious claim 1, and rely upon their arguments for claim 1 for the remaining claims rejected.

Applicants now address amended claim 4.

Distinguishing features of the invention of the amended claim 4 are the shape-memory polybutylene terephthalate laminate film comprises:

- (1)(a) a polybutylene terephthalate film, and (b) at least one selected from the group consisting of a paper sheet, another resin film and a metal foil,
- (2) the shape-memory polybutylene terephthalate laminate film is subjected to a shaping treatment to the first shape at a temperature T_4 higher than the glass transition temperature and lower than the melting point of the polybutylene terephthalate, cooled to a temperature T_5 equal to or lower than the glass transition temperature so that the laminate film is fixed to the first shape, deformed to a second shape at a temperature T_6 higher than the glass transition temperature and lower than the T_4 and then cooled to a temperature T_7 equal to or lower than the glass transition temperature so that the laminate film is fixed to the second shape, thereby (3)

making it possible to allow the polybutylene terephthalate laminate film substantially to recover the first shape from the second shape when exposed to the temperature T_4 or higher, where (4) the first shape is a curled shape, and the second shape is substantially a flat shape or an oppositely curled shape.

Accordingly, one of ordinary skill in the art would not find claim 4 anticipated or obvious over Tavss.

Applicants rely upon their arguments regarding claim 4 for claims 5 and 5.

Regarding the rejection of claim 16 under 35 U.S.C. § 103(a) based on Tavss et al. in view of Kobayashi et al. (US 6,543,208), clearly amended claim 1 of the present application is not obvious over Tavss.

Claim 16 of the present application calls for: "The shape-memory polybutylene terephthalate laminate film according to claim 13, which has a light-screening ink layer on a surface of said polybutylene terephthalate film on the side of said paper sheet, or on a surface of a rigid film on the side of said sealant film."

Claim 13 of the present application calls for: "The shape-memory polybutylene terephthalate laminate film according to claim 1, which has a layer structure comprising said polybutylene terephthalate film, said paper sheet and a sealant film in this order."

Applicants submit claim 16 is not obvious over Tavss in view of Kobayashi, and offer the following specific comments in Kobayashi.

Kobayashi discloses a bag for packaging food products which is formed of a laminated film having a structure of polyester-type sealant layer with a low melting point/barrier layer

(vapor-deposited layer of ceramic or metal)/polyester-type heat resistant layer with a high melting point, the bag being formed by heat sealing the film such that the polyester-type low melting point sealant layer forms an inner side (Abstract of Kobayashi).

Kobayashi thus teaches the use of monomer such as terephthalic acid and 1,3-butanediol to form a polyester resin having a melting point of about 80°C for polyester-type sealant layer with a low melting point, and is silent as to the use of terephthalic acid and 1,4-butanediol to form polybutylene terephthalate as a polyester-type heat resistant layer with a high melting point (see column 2, lines 39-44 of Kobayashi), albeit Kobayashi teaches the use of terephthalic acid among dicarboxylic acids and ethylene glycol among diols as the monomers of the polyester-type high melting point resin to obtain PET resin (polyethylene terephthalate) (see column 3, lines 57-63 of Kobayashi).

Thus, Kobayashi teaches that when the passage of light needs to be shut off, materials such as metal aluminum (Al) are vapor-deposited, thereby forming a vapor-deposited metal layer (see column 3, lines 45-47 of Kobayashi).

Although Kobayashi describes at column 4, line 60 to column 5, line 1 thereof that when the vapor-deposited layer is of transparent material such as SiO_x , Al_2O_3 , SiO_x/ZnO , SiO_x/CaO , $\text{SiO}_x/\text{B}_2\text{O}_3$, $\text{CaO}/\text{Ca}(\text{OH})_2$, it is preferable, from the point of view of printing aesthetics to **use a back side printing method**, by which printing is performed on the surface of the vapor-deposited layer, this printing is performed to add **marketability** to a bag for packaging food, thereby forming a multiple layer such as polyester-type low melting point sealant

layer/**ink**/vapor-deposited ceramic layer/polyester type high melting point heat resistant layer (e.g., PET film), or on the other hand, if the ink will be an obstacle at the time of material recycling, it is desirable to take a front printing method, by which printing is performed on the surface of the polyester-type high melting point heat resistant layer, thereby forming a polyester-type low melting point sealant layer/vapor-deposited ceramic or metal layer/polyester-type high melting point. heat resistant layer (e.g., PET film)/**ink**, whose features are different from those recited in claim 16 of the present application such as a PBT film/**ink**/paper sheet/(rigid film)(PET)/sealant film(PE) or PBT film/paper sheet/(rigid film)(PET)/**ink**/sealant film(PE).

Applicants thus submit that one of ordinary skill in the art would not find claim 16 obvious over Tavss in view of Kobayashi.

Regarding the rejection of claim 18 under 35§ 103 (a) based on Tavss, claim 18 of present application calls for: "A container lid constituted by the shape-memory polybutylene terephthalate laminate film recited in claim 1."

Since amended claim 1 of the present application is not obvious over Tavss, patentability of claim 18 is clear at least by virtue of the basis of its dependency from the amended claim 1. However, the following remarks are offered on the rejection of claim 18.

Tavss teaches dispensing containers of single layer or multi-layer wall construction which have a decreased degree of flavorant absorption through the use of a polybutylene terephthalate-polyethylene blend as the innermost surface of the container (see column 2, lines 49-54 of Tavss) with another layer such as aluminum foil having barrier properties for oxygen and for organics such as flavorant oils (see column 3, lines 36-44 of Tavss),

Specifically, Tavss teaches a multi-layer tube construction configuration comprising an innermost layer 11, a layer of the blend of polybutylene terephthalate and polyethylene, a layer 12, usually an adhesive layer, which bonds the polybutylene terephthalate and polyethylene blend layer with another layer such as metal foil layer 13, aluminum foil, a layer 14, another adhesive layer that secures the other side of the optional metal foil layer to an optional paper layer 15, and a topmost layer 16, usually constructed of the same material of layer 11, in this order (see column 3, lines 28-51; and Figs 1 and 2 of Tavss).

However, Tavss does not teach or suggest that at least the three layers of an innermost layer 11, a layer of the blend of polybutylene terephthalate and polyethylene, a layer 12, an adhesive layer, and a metal foil later 13 recover the first shape, a curled shape, from the second shape, a flat shape or an oppositely curled shape, when the three layers are exposed to the temperature T_1 , equal to or lower than the glass transition temperature of the polybutylene terephthalate or higher.

In contrast to Tavss, the container lid of claim 18 constituted by the shape-memory polybutylene terephthalate laminate film recited in amended claim 1 is not curled when sealed to the container, and it keeps a curled state when peeled from the container (having dead-folding characteristics) (see page 2, lines 22-28; page 36, line 12 to page 37, line 10; and Figs, 13 and 14 (first method; amended claim 1); and page 37, line 19 to page 38, line 6; and Figs, 15 and 16 (second method; amended claim 4), of the specification).

Addressing the rejections under 35 U.S.C. § 112, first “at least one selected from...comprising it” is clarified.

With respect to claim 1, lines 8-10, it is believed that the language added to the end of the claim clarifies claim 1.

Regarding claim 16, antecedent basis is provided.

However, if the Examiner does find any of the language still to be objectionable, the Examiner is requested to contact the undersigned at the later given telephone exchange.

With respect to the Examiner's position on process limitations in a product claim, Applicants respectfully submit the Examiner to be in error with respect to claim 1 as now amended. Specifically, "a curled shaped" and "flat shape or an oppositely curled shape" quite clearly are not process limitations. Rather, these are positive limitations which limit the nature of the shape.

Thus, Applicants submit claim 1 as amended contains limits which construed in total are entitled to patentable weight.

Withdrawal of all rejections and allowance is requested

A telephone interview is requested concerning this application.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Application No. 10/528371

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Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

/Peter D. Olexy/
Peter D. Olexy
Registration No. 24,513

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

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